

2.0 GEOLOGY

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2.1 Regional Geology

Duval County lies wholly within the Sand Plain subprovince of the Texas Gulf Coastal Plain. All of the county is situated on the northeast flank of the southeastern plunging synclinal Rio Grande Embayment. Surficial geology consists of either late Tertiary, early Quaternary sediments deposited by the Rio Grande fluvio-deltaic system or Holocene alluvial and eolian deposits.

Topography structure and stratigraphy of Duval Country are discussed in greater detail below.

2.1.1 Topography

Topography of Duval County is typical of south Texas Gulf Coastal Plains. Relief is generally 40 feet or less and surface gradients average less than 40 feet per mile. Drainage gradients (20 feet per mile plus) are somewhat higher than normal coastal plain. The drainage within Duval County is intermittent, which results in sediment clogged streams with gradients associated with semi-arid climates.

Because of this climate, extensive caliche development can be found throughout the county. Caliche forms a caprock armour which supports distinctive northeast-southwest trending escarpments found in northwest Duval Country.

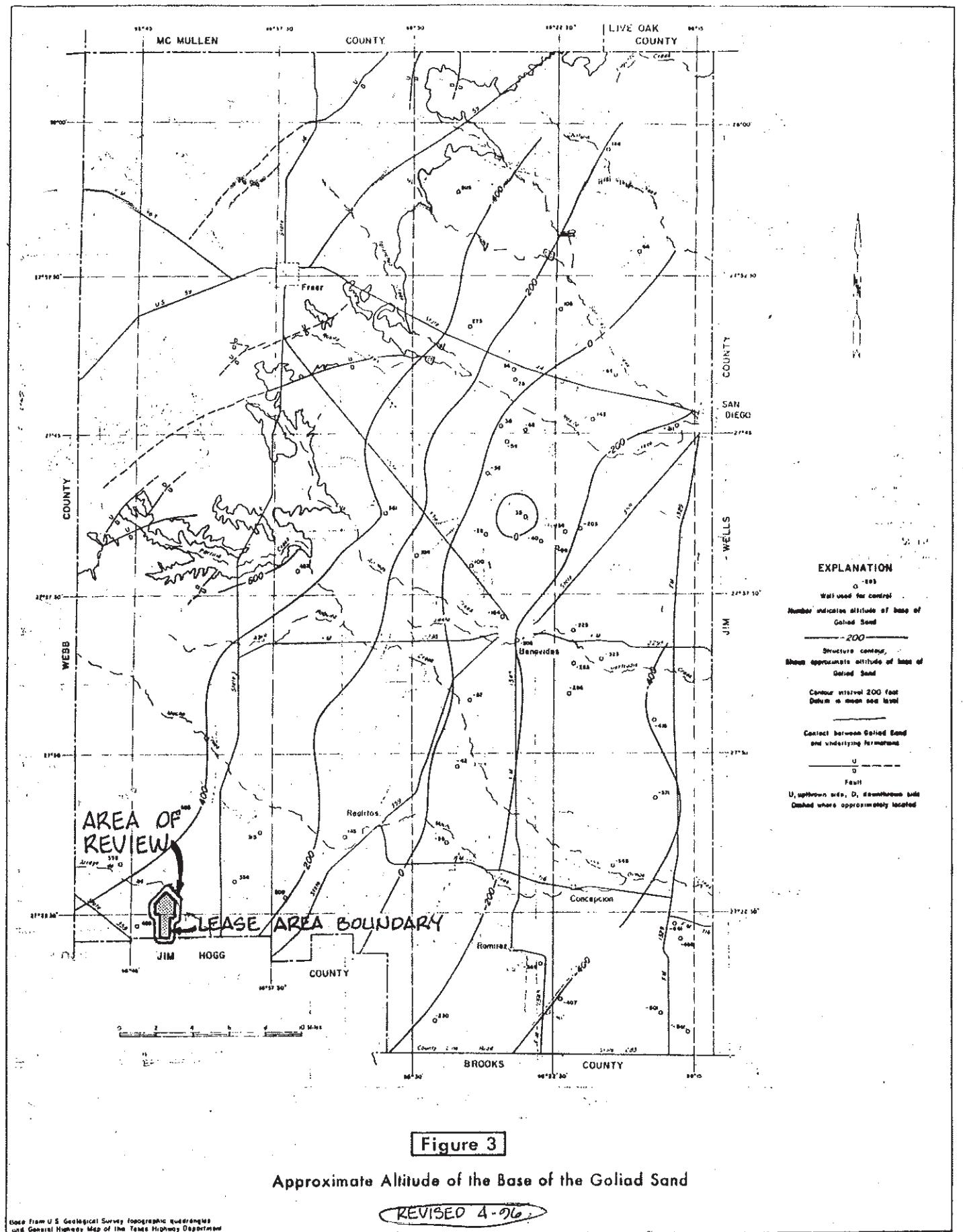
Duval County lies between the Nueces River and Rio Grande drainage systems. Streams trend southwest and empty directly into the Texas Gulf. This feature combined with the low rainfall and high evaporation results in poorly defined drainage systems and in some cases, closed drainage basins.

2.1.2 Structure

Formations outcropping or underlying Duval County strike approximately N 25 E, and dip to the southeast at 15 to 80 feet per mile (Figs. 2, 3, 4, and 5). In localized areas dips may be reversed and/or increased to 180 feet per mile because of faulting or deformation proximal to salt dome development.

The county can be typed as a broad southeastern dipping monocline broken locally by one fault zone and an area of salt dome development. The fault zone trends northeast-southwest in the northwestern part of the county. Relief on the echelon down to the coast faults is variable, but have sufficient closure for oil and gas entrapment. Local antithetic up the coast faults form bounding faults for horsts and grabens in the overall fault trend.

A second structural feature is the Palangana Salt Dome which is approximately six miles north of Benavides. Around the dome, structural attitude of sedimentary sequences are altered or reversed to the regional trend (Figs. 3, 4, and 5). On the dome, the Oakville and Catahoula units are absent, the influence of the dome has impacted the Goliad sediments.



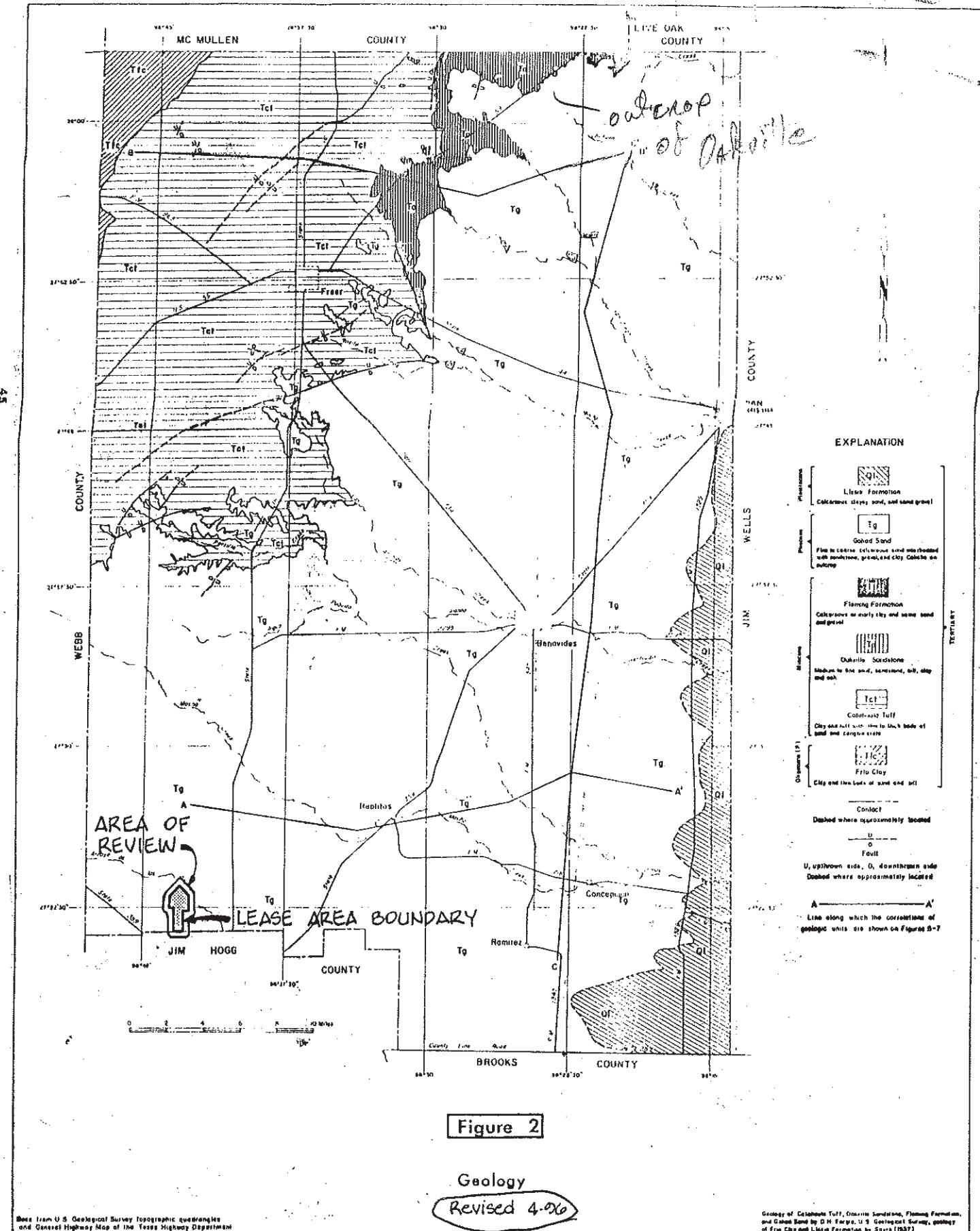
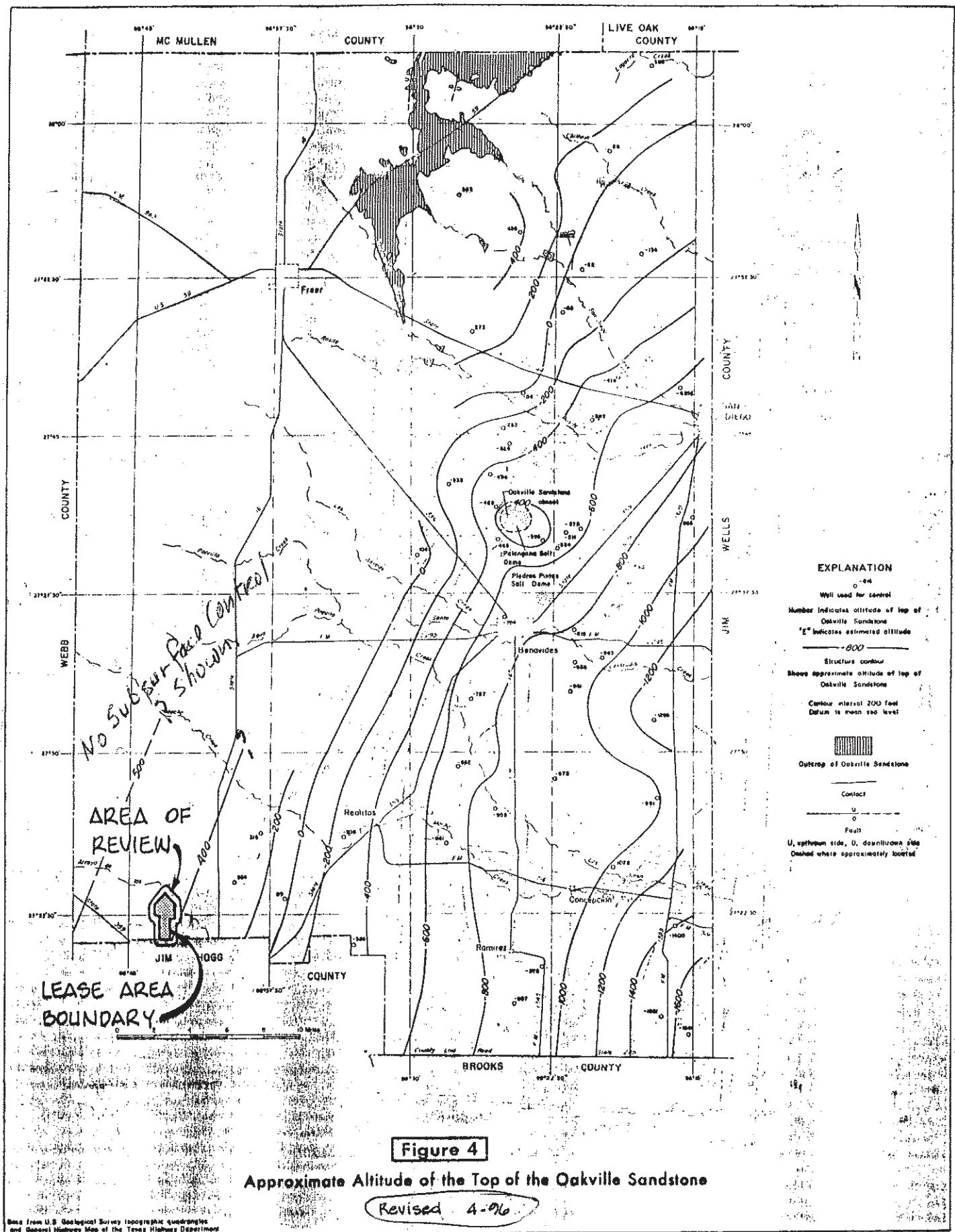


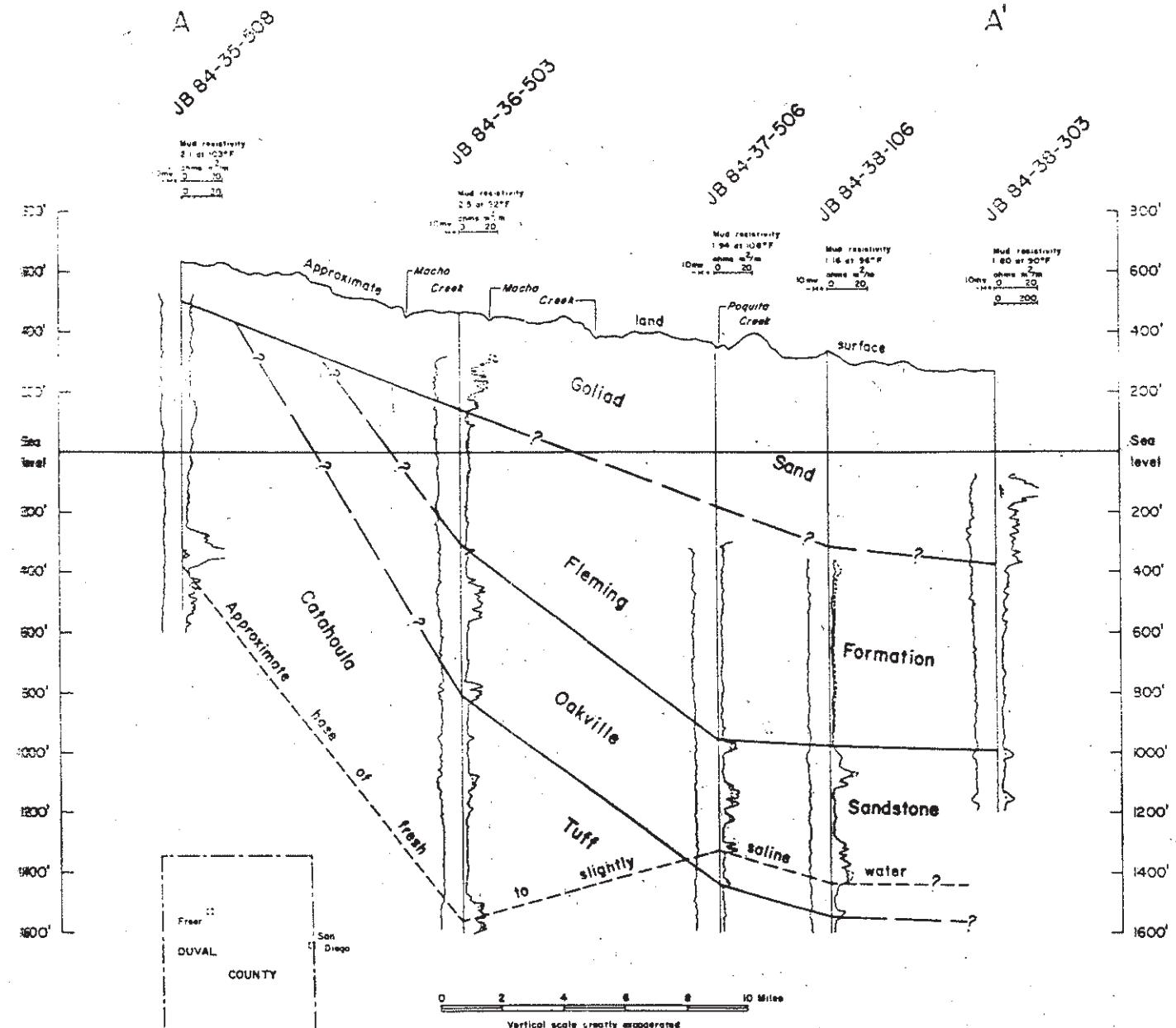
Figure 2

(From Shofer, G.H., Ground-Water Resources of Duval County, Texas:
Texas Water Development Board, Report 181 P.9)

Geology of Caldwell Tuff, Dolomite Sandstone, Fleming Formation, and Gated Sand by O.H. Farley, U.S. Geological Survey, Geology of Frio Clay and Limestone by Sykes (1937)



(From Shaffer, G. H., Ground-Water Resources of Duval County, Texas: Texas Water Development Board, Report 181, RIB)



AREA OF
REVIEW

Correlation of Geologic Units Along Line A-A'

Figure 6

(From Shafer, G.H., Ground-Water Resources of Duval County, Texas:
Texas Water Development Board, Report 181 p. II)

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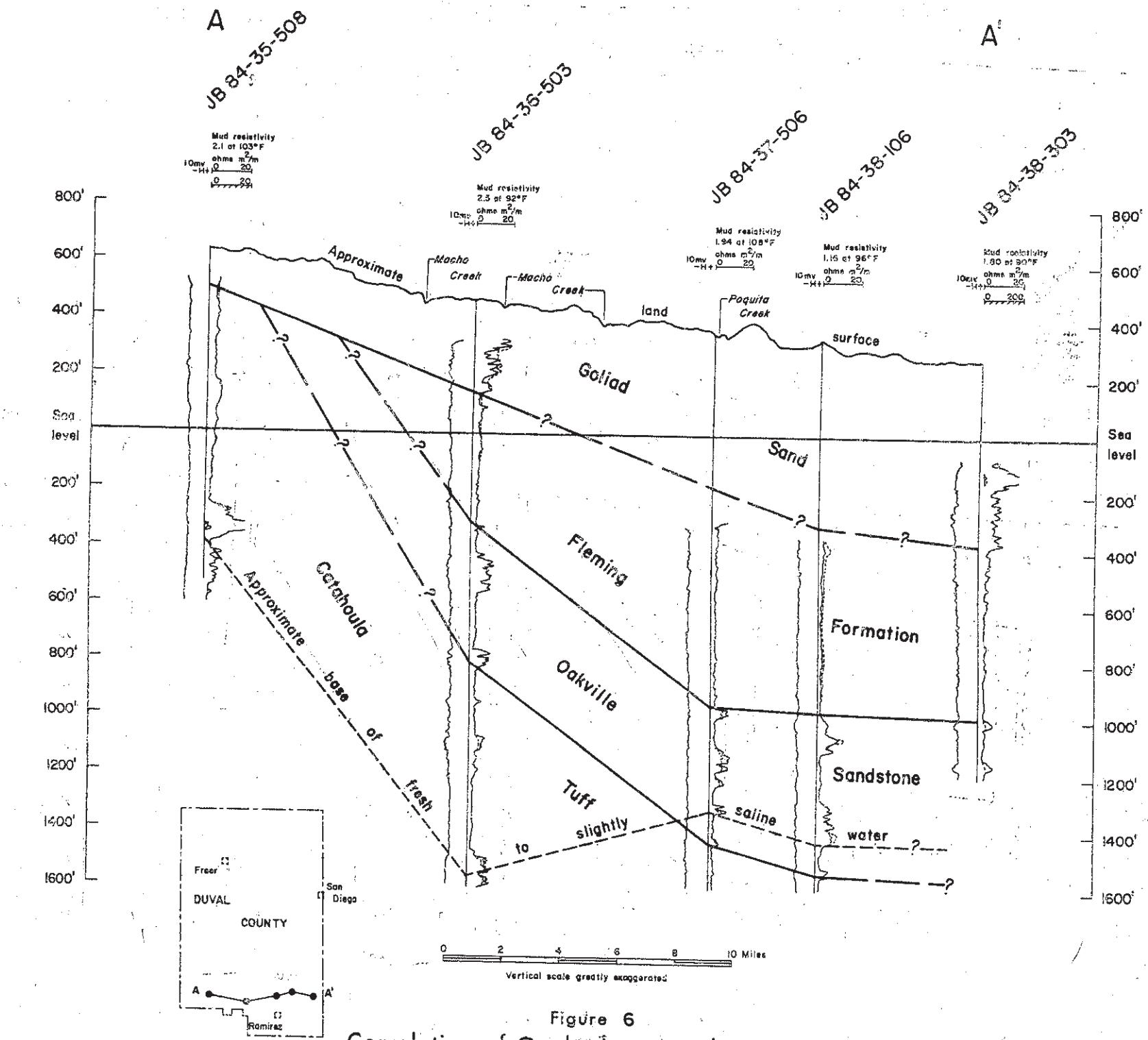
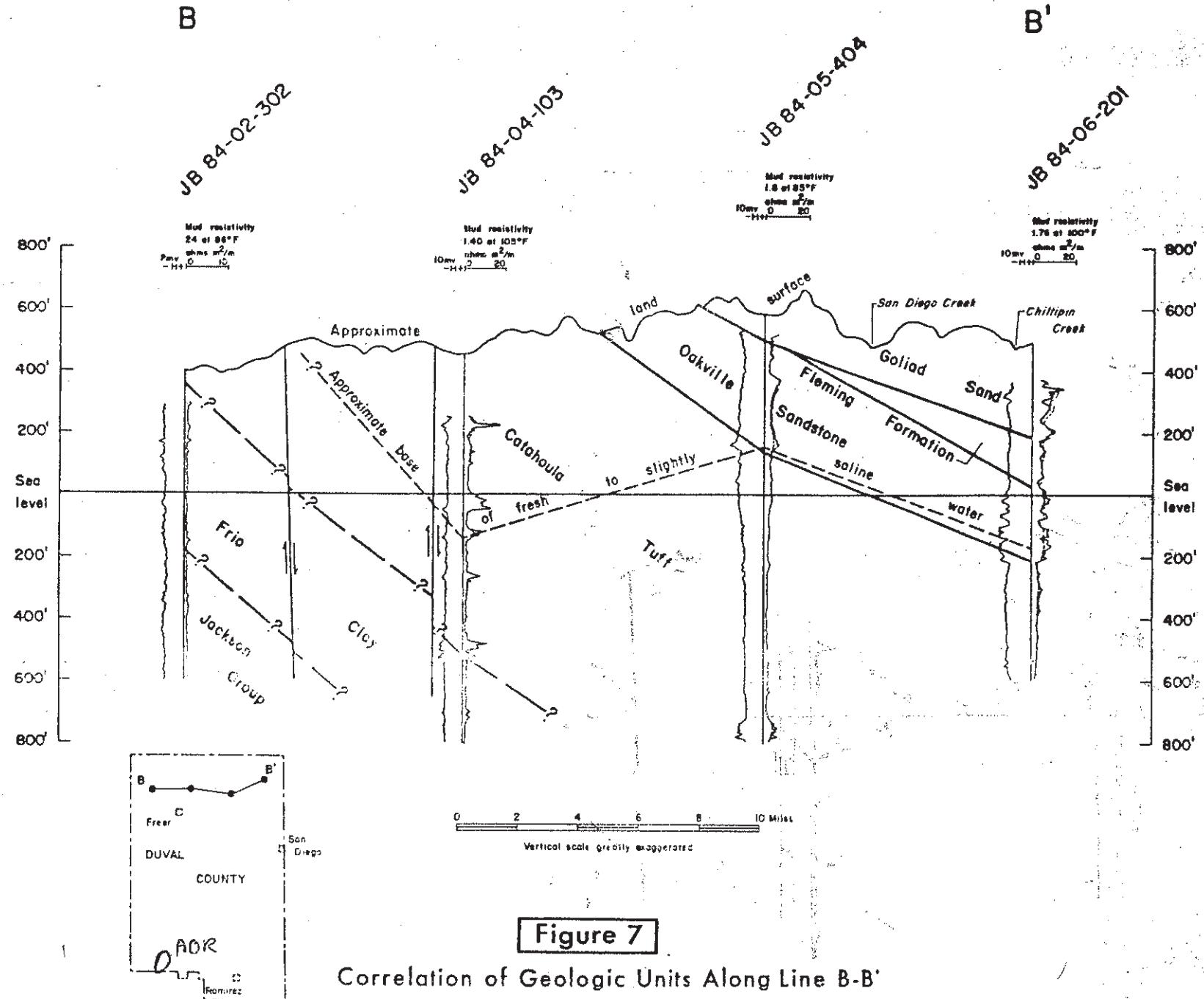


Figure 6
Correlation of Geologic Units Along Line A-A'



(From Shafer, G.H., Ground-Water Resources of Duval
County, Texas, Texas Water Development Board 181 P.13)

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